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(54) **Apparatus and methods for making differentially-conditioned package pairs.**

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Description

This invention relates to vacuum packaging methods and apparatus. More particularly, this invention relates to the production of integral package pairs in which different products are simultaneously packaged in adjoining packages.

Evacuated packages formed of heat-sealable flexible packaging materials with a low rate of gas permeability have found wide acceptance because of their extended shelf life as compared to conventional packages. Where atmospheric pressure surrounding a vacuum package could cause mechanical damage to the packaged product or to its container, inert gases such as nitrogen may be introduced into the package after evacuation to reduce or eliminate the pressure differential to which the package walls would otherwise be subjected. In producing such packages automatically the packages may be partially sealed before the evacuating or gassing operations are performed.

The packages are often formed from two continuous sheets of packaging material. One sheet may be formed into cup-shaped containers, and the other sheet laid down as a cover or top over the containers. An aperture may be formed adjacent the container for evacuation and possible subsequent back-filling with gas. A web-lifter may be provided in the machine sealing station which tents the top web to improve the evacuation and/or gassing of the packages. The aperture opening may be located between two adjacent containers which can be processed in the same manner because of the common opening. More detail is available in U. S. Patent 3,061,984 to R. A. Mahaffy which is assigned to the Assignee of the present invention and which forms the basis for the preamble of claims 1 and 10.

In accordance with the invention as mainly defined in claims 1 and 10, there is provided improved packaging techniques for forming dual packages in the form of integral package pairs wherein the separate package units of each pair are differentially conditioned simultaneously as by being provided with, for example, different vacuum levels, different gas pressures, or different gases. The separate packages of the pairs are arranged in parallel rows and carry different products which must be packaged under different evacuation or gassing conditions. This invention provides new and improved means for packaging such different products in adjoining packages with different amounts of evacuation or gassing to the product being packaged.

In one illustrative embodiment thereof, different products are packaged under different conditions at the same time by apparatus conveying a continuous series of filled side-by-side cup-like containers, made from a single sheet of packaging material, in two parallel rows into a sealing region. The containers of one row carry one type of product, and the containers of the other row carry a different product. A second sheet of packaging material is laid down over the filled containers to make packages. A group of the packages is stopped in a sealing region of the apparatus, clamped and partially sealed around their peripheries. Then, differential atmospheres are created in the individual units of the package pairs through aligned openings between adjacent packages in the respective rows. Thereafter, the openings and the remainder of the package peripheries are sealed. The group of completed packages are then removed from the sealing region and the process repeated. The differential atmosphere in the individual units of each package pair may be in the form of differential evacuation, or evacuation followed by differential gassing, or other combinations.

Advantageously, two or more packages are produced at the same time with different pressure levels or internal atmospheres, including, where appropriate, different gas compositions. An illustrative application of this type of packaging would be the combination of cooked pasta and sauce; the sauce package would ideally use a full vacuum while the pasta package would have less than full vacuum to prevent crushing or squeezing the pasta and destroying its quality.

Other objects, aspects and advantages of the invention will be pointed out in, or apparent from, the following detailed description of a preferred embodiment of the invention, considered together with the accompanying drawings.

FIGURE 1 is a plan view of a part of a packaging machine embodying the present invention, with portions above the web line removed;

FIGURE 2 is a side elevation of the machine shown in Figure 1;

FIGURE 3 is a plan view showing details of the sealing region; and

FIGURE 4 is an elevational view of the machine of Figure 1 with the packages removed, as seen looking in the machine direction.

Referring now to Figures 1 and 2, there is shown a continuous sheet of plastic packaging material 10 (flexible or semi-rigid) being conveyed to the left by a chain 12 carrying the usual web clamps which grip the side edges of the sheet. The sheet 10 is formed into cup-shaped containers 14 loaded with product (not shown), and arranged in two side-by-side rows A and B. Evacuation openings 16A and 16B are cut through the plastic between successive container pairs, in the machine direction (i.e. fore-and-aft). As shown in Figure 2, a second continuous web of plastic packaging material 18 is laid down over the first web 10 to cover

the filled containers 14 and thereby form packages 20.

The conveyor chain 12 is driven with an intermittent indexing movement. In each advancing step, a group of four packages 20 is moved into a seal region 22 of the apparatus. In this region, there is a sealing die 24 below the web line 26, and a sealing head 28 above the web line. These two units reciprocate vertically in synchronism, and come together (as shown in Figure 2) to clamp the peripheries of the group of four packages then stopped in the seal region 22.

The sealing die 24 and the sealing head 28 cooperate, when in closed position, to form two separate sealed chambers over the package rows A and B respectively, and to clamp the packages firmly within those chambers. The chambers are identified in Figure 4 with the numerals 30A, 30B. As shown in Figure 3, each chamber contains two packages, adjacent in the fore-and-aft direction, with an evacuation opening 16A,B between the two.

The sealing head 28 includes two sets of initial sealing bars 40A, 40B which form by heat and pressure initial seals 42A, 42B (see particularly the upper portion of Figure 3) partially around the periphery of all four packages then in the sealing chambers. This initial seal leaves an open space 44A, 44B around each evacuation opening 16A,B, to provide for communication through that opening to the interiors of the two fore-and-aft adjoining package sets. A web-lifter 46A,B (Figure 4) is incorporated to automatically push up the top web into a tent-like formation to provide for effective transfer of air during evacuation, and of gas during a subsequent gassing operation. Sealing methods other than heat and pressure can be used where appropriate, although heat and pressure will be used in most applications.

With continued reference to Figure 4, a source of vacuum 50 is connected through vacuum regulators 52A, 52B and flexible hoses 54A, 54B to respective vacuum valves 56A, 56B beneath the chambers 30A, 30B respectively. These valves communicate through corresponding ports in the sealing die 24 to the lower interior portions of the respective chambers. The chambers are sealingly isolated one from the other within the sealing die and sealing head structure.

In operation, when the chambers 30A, 30B are closed and the initial seals 42A,B made, valves 56A, 56B are opened to provide vacuum through the vacuum regulators 52A,B from the vacuum source 50. The vacuum is applied through ports 60A,B and the corresponding slots 16A, 16B into the interior of the packages 20 then in the seal region 22. The packages all are evacuated to preset vacuum levels controlled by the vacuum regulators 52A,B. In the preferred embodiment described herein, the vacuum regulators are pre-set to provide different vacuum levels. Thus, the packages in row B are evacuated to a different vacuum level from those in row A.

At the end of the period required for evacuation, final seal bars 64A,B are moved by pneumatic cylinders 66A,B down against the remaining open (unsealed) areas 44A,B as seen in Figure 3. These final seal bars seal by heat and pressure around the evacuation slots 16A,B, thereby completely sealing all four packages of the group. The lower section of Figure 3 (row A) illustrates a final-sealed package as sealed by the procedure just described, while in the upper section (row B) the area 44B is shown unsealed simply to illustrate how the process works. In normal operation, both areas 44A,B would be completely sealed at approximately the same time.

For certain applications, the vacuum level supplied to both chambers 30A,B may be identical, and the differential vacuum in the package groups may be achieved by actuating the final seal bars for the two chambers before completion of the normal evacuation period, i.e. so that the final seal bar for at least one of the chambers is actuated before the vacuum in that chamber has reached the level of the vacuum being supplied. For example, row A may be limited to a vacuum level higher than that supplied simply by actuating the final seal bar before the end of the normal period for evacuation, while row B is allowed to become fully evacuated to the limit of the vacuum supply before actuating its final seal bar.

After evacuation and before the final seal bar descends, the package may be back-filled with gas. The gas supply means may for example comprise flexible hoses 70A,B connecting to a controlled gas source, and leading through valves 72A,B and passageways 74A,B to the ports 60A,B and hence to the openings 16A,B. The gas pressures supplied to rows A and B may be differentially controlled, for example to achieve a gas pressure in the packages of row A which is different from that in the packages of row B. Such differential control may, when appropriate, be used to supply gases of different composition to the two sets of packages, i.e. in rows A and B.

Once the package group consisting of the four packages 20 in the seal region 22 has been evacuated, back-filled with gas (when appropriate) and sealed, the chambers 30A,B are vented to the atmosphere. The sealing die 24 and sealing head 28 then are moved away from the packages. All four packages of the group then are indexed out and a new group is indexed into position in the seal region 22, and the cycle is repeated.

The completed (sealed) packages are cut apart in a cutting area of the machine. For this purpose,

the fore-and-aft package sets (two in each set) are cut apart, i.e. through the region containing the evacuation slots 16A,B. The side-by-side adjoining packages however remain as integral package pairs or a "dual" package set, in which the separate packages are differentially conditioned, as by having different vacuum levels, or different gas levels, or different gas compositions.

As has been pointed out, the differential pressure in the integrally connected packages may be provided by back-filling with gas, in which case the vacuum source 50 may be augmented with a gas supply or a plurality of gas supplies which may be fed through different valves to row A or B to provide a differential gas pressure, or different gas compositions for each row. For example, one package might be back-filled with CO_2 while the other package might be back-filled with nitrogen, depending on the product and the purpose of the back-filling. In addition, a combination may be provided to evacuate both packages and back-fill one with gas, leaving the other as a pure vacuum package without gas.

The present invention provides automatic packaging machinery capable of supplying two or multiples of two packages which are differentially-conditioned, as by having different pressure levels, either vacuum or gas, or a combination of each, or different gas compositions. The method of the present invention is particularly useful when packaging two related but different types of products in connected (adjoining) packages. One example of this is packaging a pasta in one package and the sauce for the pasta in the adjoining package of the pair. The sauce could be under maximum vacuum while the pasta could be under lesser vacuum to prevent crushing or squeezing of the product. In accordance with the invention, separate production lines do not have to be set-up to process each product. The entire process may be carried out simultaneously in the same machine with consistent results.

Although specific preferred embodiments of the invention have been described hereinabove in detail, it is desired to emphasize that this has been for the purpose of illustrating the invention, and should not be considered as necessarily limitative of the invention, it being understood that many modifications can be made by those skilled in the art while still practicing the invention claimed herein.

Claims

1. A method of packaging different products in respective individual containers of an integrally-adjoining package (20) forming an assembly, said method comprising the steps of:
   - conveying a continuous series of product-filled containers (14) of an integrally-adjoined package (20) in at least two parallel rows (A, B);
   - covering said containers (14) to form a package (20);
   - moving a group of said containers (14) into a sealing region (22), said group including at least one integrally-adjoining package (20) forming an assembly;
   - arranging to provide openings to communicate with the interior of each container (14) for the purpose of evacuating each container (14);
   - sealing said containers (14) including said openings to effect a final seal of the individual containers (14) of said integrally-adjoining packages (20) forming an assembly; and
   - removing said sealed packages (20) from said sealing region (22),

   characterized by the steps of
   - filling at least two of adjacent containers (14) of an integrally-adjoining package (20) forming an assembly with different products,
   - differentially, individually and simultaneously conditioning the interiors of the individual containers (14) of each of said integrally-adjoining packages (20) forming an assembly through respective evacuation openings leading into the container interiors and
   - sealing the containers (14) in their differentially conditioned state.

2. The method as claimed in Claim 1, characterized in that the containers (14) of said integrally-adjoining package (20) forming an assembly are formed from a single sheet of plastic packaging material.

3. The method as claimed in Claim 1 or 2, characterized in that the differential conditioning of the containers (14) of said integrally-adjoining packages (20) comprises positioning the individual containers (14) of the integrally-adjoining packages (20) forming an assembly in respective sealed chambers; and evacuating each of the individual containers (14), through separate vacuum passageways supplied with vacuum of different levels.

4. The method as claimed in one of Claims 1 to 3, characterized in that a group of integrally-adjoined packages (20) is in the form of two sets of packages (20) and that said step of

differential conditioning comprises differentially conditioning both sets of packages (20) simultaneously and in identical fashion.

5. The method as claimed in one of Claims 1 to 4, characterized in that said two sets of packages (20) are disposed one behind the other in the direction of movement of said filled containers (14), thereby forming two sets of fore-and-aft packages each with one container (14) in each row and in that the fore-and-aft containers (14) of each set are differentially conditioned together through a common evacuation opening.

6. The method as claimed in one of Claims 1 to 5, characterized in that said integrally-adjoined package (20) forming an assembly is covered by a sheet of plastic packaging material and in that said sheet of material is lifted up over both of said evacuation openings during the differential conditioning thereof.

7. The method as claimed in one of Claims 1 to 6, characterized in that back filling is provided to establish different gas pressures in each individual container (14).

8. The method as claimed in one of Claims 1 to 7, characterized in that the back filling is provided to establish different gas compositions in the individual containers (14) of each intergrally-adjoining package (20) forming an assembly.

9. The method as claimed in one of Claims 1 to 8, characterized in that the differential conditioning of said integrally-adjoining package (20) comprises evacuating said containers (14) simultaneously; and in that one of said containers (14) is final-sealed prior to the final-sealing of the other container (14) and that the other container (14) is continually evacuated until that other container (14) is final-sealed whereby a differential vacuum in said integrally-adjoining package (20) forming an assembly is produced.

10. Apparatus for conditioning containers (14) for packaging different products in one package (20) forming an assembly comprising
- two opposed sides with one of said sides including an opening therein
- holding means for supporting said container (14)
- evacuation means positioned adjacent the side of said container (14) having said opening
- means to provide a conduit through said opening to evacuate said container
- pressure-compensating means engageable with the other side of said container to seal the entire area of said other side from atmosphere
- and vacuum means connected to said pressure-compensating means to reduce the pressure applied to said other side of said container (14) during evacuation of said container (14) characterized in that
- the holding means comprise a tray with at least two rows of containers (14)
- the evacuation means positioned adjacent the side of each container (14) are individually adjustable and that
- separate conditioning means are provided for each container (14) which are each connected to an individual source of gas and separately adjustable according to the specific requirements of the container they are linked to.

Patentansprüche

1. Verfahren zum Verpacken von unterschiedlichen Produkten in entsprechenden Einzelbehältern einer aus direkt aneinandergrenzenden Behältern bestehenden, eine zusammenhängende Einheit bildenden Verpackungsanordnung (20) in den Schritten:
- Befördern einer kontinuierlichen Folge von mit Produkten gefüllten Behältern (14) einer aus direkt aneinandergrenzenden Behältern bestehenden Verpakkungsanordnung (20) in mindestens zwei parallelen Reihen (A, B);
- Abdecken der Behälter (14) zur Bildung einer Verpackungsanordnung (20);
- Überführen einer Gruppe dieser Behälter (14) in eine Versiegelungszone (22), wobei diese Gruppe mindestens eine aus direkt aneinandergrenzenden Behältern bestehende, eine Einheit bildende Verpackungsanordnung (20) umfaßt;
- Vorkehrungen treffen, daß Verbindungsöffnungen zum Zwecke der Evakuierung eines jeden Behälters (14) zum Innern eines jeden Behälters (14) ausgebildet werden;
- Versiegeln der Behälter (14) sowie der Öffnungen, um eine Endversiegelung der Einzelbehälter (14) dieser aus direkt aneinandergrenzenden Behältern bestehenden, eine Einheit bildenden Verpakkungsanordnungen (20) zu erhalten; und
- Entfernen der versiegelten Verpackunganordnungen (20) aus der Versiege-

lungszone (22),
gekennzeichnet durch die Schritte:

- Befüllen von mindestens zwei nebeneinander angeordneten Behältern (14) einer direkt aus aneinandergrenzenden Behältern bestehenden Verpackungsanordnung (20) unter Ausbildung einer verschiedene Produkte enthaltenden Einheit,
- unterschiedliche, individuelle und gleichzeitige Konditionierung des Inneren der Einzelbehälter (14) einer jeden der aus aneinandergrenzenden Behältern bestehenden, eine Einheit bildenden Verpakkungsanordnungen (20) durch entsprechende in das Behälterinnere führende Evakuierungsöffnungen und
- Versiegeln der Behälter (14) mit ihrem unterschiedlich konditioniertem Zustand.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß die Behälter (14) dieser aus aneinandergrenzenden Behältern bestehenden, eine zusammenhängende Einheit bildenden Verpackungseinheiten (20) aus einer einzigen Lage eines Verpackungsmaterials aus Kunststoff gebildet werden.

3. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die unterschiedliche Konditionierung der Behälter (14) dieser aus direkt aneinandergrenzenden Behältern bestehenden Verpackungseinheiten (20) folgende Schritte umfaßt: Verbringen der Einzelbehälter (14) der aus direkt aneinandergrenzenden Behältern bestehenden, eine zusammenhängende Einheit bildenden Verpackungsanordnungen (20) in entsprechend versiegelte Kammern und Evakuieren eines jeden Einzelbehälters (14) über verschiedene mit unterschiedlichem Vakuum beaufschlagte Leitungen.

4. Verfahren nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß eine Gruppe aus direkt aneinandergrenzenden Behältern bestehenden Verpackungseinheiten (20) als zwei Sätze von Verpackungseinheiten (20) ausgebildet ist und daß der Schritt der unterschiedlichen Konditionierung das gleichzeitige und auf gleiche Art und Weise geschehende, unterschiedliche Konditionieren beider Sätze von Verpackungsanordnungen (20) umfaßt.

5. Verfahren nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die zwei Sätze von Verpackungsanordnungen (20) in Bewegungsrichtung der gefüllten Behälter (14) hintereinander angeordnet sind und so zwei Sätze von längs gerichteten Verpackungsanordnungen mit je einem Behälter (14) in jeder Reihe bilden und daß die längs gerichteten Behälter (14) jedes Satzes zusammen über eine gemeinsame Evakuierungsöffnung unterschiedlich konditioniert werden.

6. Verfahren nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß die aus direkt aneinandergrenzenden Behältern bestehenden, eine zusammenhängende Einheit bildenden Verpackungsanordnungen (20) mit einer Lage Verpackungsmaterial aus Kunststoff abgedeckt werden und daß die Lage aus Kunststoff während der unterschiedlichen Konditionierung über beiden Evakuierungsöffnungen angehoben wird.

7. Verfahren nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß zur Erzielung unterschiedlicher Gasdrücke in jedem Einzelbehälter (14) eine Wiederbeaufschlagung mit Gas vorgesehen ist.

8. Verfahren nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß die Wiederbeaufschlagung mit Gas dafür vorgesehen ist, daß unterschiedliche Gaszusammensetzungen in den Einzelbehältern (14) einer aus direkt aneinandergrenzenden Behältern bestehenden, eine zusammenhängende Einheit bildenden Verpackungsanordnungen erzielt werden.

9. Verfahren nach einem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß bei der unterschiedlichen Konditionierung der aus direkt aneinandergrenzenden Behältern bestehenden Verpackungsanordnung (20) die beiden Behälter (14) gleichzeitig evakuiert werden und einer der Behälter (14) vor der Endversiegelung des anderen Behälters endversiegelt wird und der andere Behälter kontinuierlich bis zu seiner Endversiegelung evakuiert wird, wobei ein unterschiedliches Vakuum in der aus direkt aneinandergrenzenden Behältern bestehenden, eine zusammenhängende Einheit bildenden Verpackungsanordnung (20) ausgebildet wird.

10. Vorrichtung zur Konditionierung von Behältern (14) für die Verpackung unterschiedlicher Produkte in einer eine zusammenhängende Einheit bildenden Verpackungsanordnung, enthaltend

- zwei sich gegenüberstehende Seiten, wobei eine der Seiten eine Öffnung aufweist,
- Haltevorrichtungen zum Tragen des Behälters (14),
- neben der eine Öffnung aufweisenden

Seite des Behälters (14) angebrachte Evakuierungsmittel,
- Mittel zum Anbringen einer Leitung durch die Öffnung zur Evakuierung des Behälters,
- auf der anderen Seite des Behälters einwirkbare Druckausgleichsmittel zur Luftversiegelung des gesamten Bereichs der anderen Seite,
- mit den Druckausgleichsmitteln verbundene Mittel zur Erzielung eines Vakuums zur Verminderung des auf der anderen Seite des Behälters (14) während seiner Evakuierung aufgebrachten Drucks,
- dadurch gekennzeichnet, daß
- die Haltevorrichtungen ein Tablett mit mindestens zwei Behälterreihen umfassen,
- die neben der Seite eines jeden Behälters (14) angebrachten Mittel zur Evakuierung einzeln regelbar sind und
- für jeden Behälter getrennte Konditionierungsmittel vorgesehen sind, die jeweils an eine eigene Gasquelle angeschlossen und getrennt regelbar sind, gemäß den speziellen Anforderungen an die daran angeschlossenen Behälter.

Revendications

1. Procédé de conditionnement de produits différents dans des récipients individuels respectifs d'un conditionnement (20) d'emballages adjacents et solidaires formant un ensemble, le procédé comprenant les étapes suivantes :
   - le transport d'une série continue de récipients (14) remplis d'un produit d'un emballage (20) à récipients adjacents solidaires en au moins deux lignes parallèles (A, B),
   - le recouvrement des récipients (14) afin qu'un conditionnement (20) soit formé,
   - le déplacement d'un groupe de récipients (14) dans une région de scellement (22), le groupe comprenant au moins un emballage (20) à récipients adjacents et solidaires formant un ensemble,
   - la disposition d'orifices assurant la communication avec l'intérieur de chaque récipient (14) afin que chaque récipient (14) puisse être évacué,
   - le scellement des récipients (14) ayant les orifices afin qu'une soudure finale des récipients individuels (14) des emballages (20) à récipients adjacents solidaires formant un ensemble soit réalisé, et
   - l'extraction des emballages scellés (20) de la région de scellement (22),

   caractérisé par les étapes suivantes
   - le remplissage d'au moins deux récipients adjacents (14) d'un emballage (20) à récipients adjacents et solidaires formant un ensemble, avec des produits différents,
   - le conditionnement différentiel, individuel et simultané de l'intérieur des récipients individuels (14) de chacun des emballages (20) à récipients adjacents et solidaires formant un ensemble par les orifices respectifs d'évacuation débouchant à l'intérieur des récipients, et
   - le scellement des récipients (14) à leur état conditionné différentiellement.

2. Procédé selon la revendication 1, caractérisé en ce que les récipients (14) de l'emballage (20) à récipients adjacents solidaires formant un ensemble sont réalisés à partir d'une seule feuille d'un matériau d'emballage de matière plastique.

3. Procédé selon la revendication 1 ou 2, caractérisé en ce que le conditionnement différentiel des récipients (14) des emballages (20) à récipients adjacents solidaires comprend le positionnement des récipients individuels (14) des emballages (20) à récipients adjacents et solidaires formant un ensemble dans des chambres respectives de scellement, et l'évacuation de chacun des récipients individuels (14) par des passages séparés sous vide qui sont soumis à un vide à des niveaux différents.

4. Procédé selon l'une des revendications 1 à 3, caractérisé en ce qu un groupe de emballages (20) à récipients adjacents solidaires est sous forme de deux jeux d'emballages (20), et en ce que les étapes du conditionnement différentiel comprennent le conditionnement différentiel des deux jeux d'emballages (20) simultanément et d'une manière identique.

5. Procédé selon l'une quelconque des revendications 1 à 4, caractérisé en ce que les deux jeux d'emballages (20) sont placés l'un derrière l'autre dans la direction de déplacement des récipients remplis (14), si bien que deux jeux d'emballages disposés dans la direction avant-arrière sont formés chacun avec un récipient (14) dans chaque ligne, et en ce que les récipients (14) dans la direction avant-arrière de chaque jeu sont conditionnés différentiellement ensemble par un orifice commun d'évacuation.

6. Procédé selon l'une quelconque des revendications 1 à 5, caractérisé en ce que l'emballage (20) à récipients adjacents solidaires formant un ensemble est recouvert d'une feuille d'un matériau d'emballage de matière plastique, et en ce que la feuille du matériau est soulevée au-dessus des deux orifices d'évacuation pendant le conditionnement différentiel.

7. Procédé selon l'une quelconque des revendications 1 à 6, caractérisé en ce qu'un remplissage postérieur est réalisé afin que des pressions différentes de gaz soient établies dans les récipients individuels (14).

8. Procédé selon l'une des revendications 1 à 7, caractérisé en ce que le remplissage est réalisé afin que des compositions gazeuses différentes soient établies dans les récipients individuels (14) de chaque emballage (20) à récipients adjacents solidaires formant un ensemble.

9. Procédé selon l'une des revendications 1 à 8, caractérisé en ce que le conditionnement différentiel de l'emballage (20) à récipients adjacents et solidaires comprend l'évacuation des récipients (14) simultanément, et en ce que l'un des récipients (14) subit un scellement final avant le scellement final de l'autre récipient (14) et en ce que l'autre récipient (14) est évacué constamment jusqu'à ce que cet autre récipient (14) subisse un scellement final, si bien qu'un vide différentiel est réalisé dans l'emballage (20) à récipients adjacents et solidaires formant un ensemble.

10. Appareil de conditionnement de récipients (14) de conditionnement de produits différents dans un emballage (20) constituant un ensemble, comprenant
    - deux côtés opposés, l'un des côtés ayant un orifice,
    - un dispositif de maintien destiné à supporter le récipient (14),
    - un dispositif d'évacuation placé près du côté du récipient (14) ayant l'orifice,
    - un dispositif destiné à former un conduit passant par l'orifice afin que le récipient soit évacué,
    - un dispositif de compensation de pression destiné à coopérer avec l'autre côté du récipient afin que toute la surface de l'autre côté soit fermée de manière étanche par rapport à l'atmosphère, et
    - un dispositif de vide raccordé au dispositif de compensation de pression et destiné à réduire la pression appliquée de l'autre côté du récipient (14) pendant l'évacuation du récipient (14), caractérisé en ce que
    - le dispositif de maintien comprend un plateau ayant au moins deux lignes de récipients (14),
    - les dispositifs d'évacuation placés près des côtés de chaque récipient (14) sont ajustables individuellement, et
    - un dispositif séparé de conditionnement est associé à chaque récipient (14), les dispositifs étant connectés chacun à une source de gaz individuelle et étant réglables séparément en fonction des conditions particulières du récipient auquel ils sont reliés.

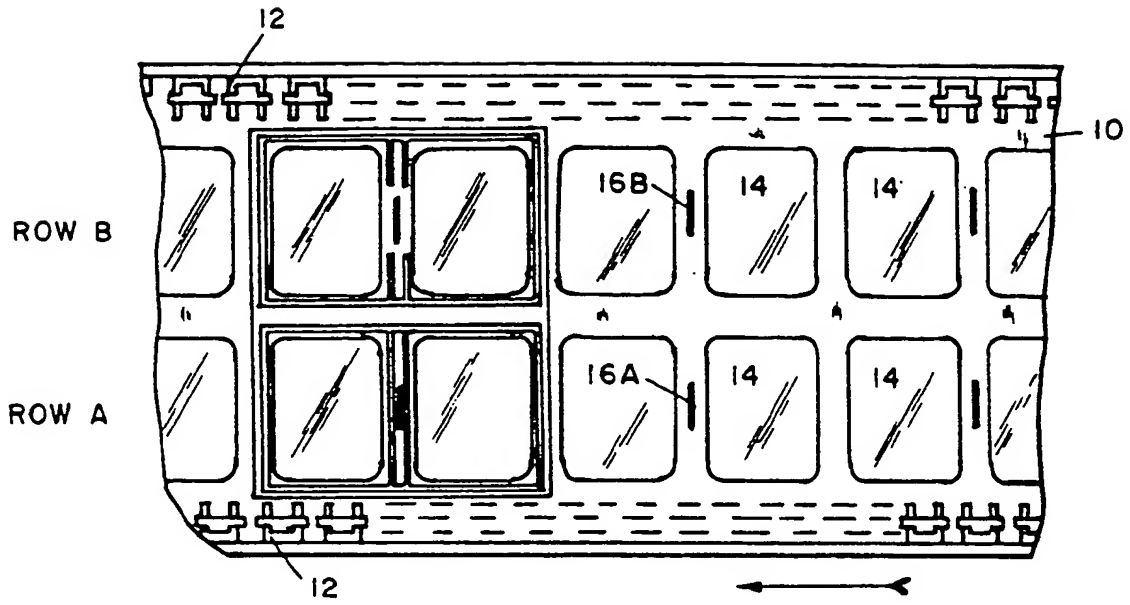
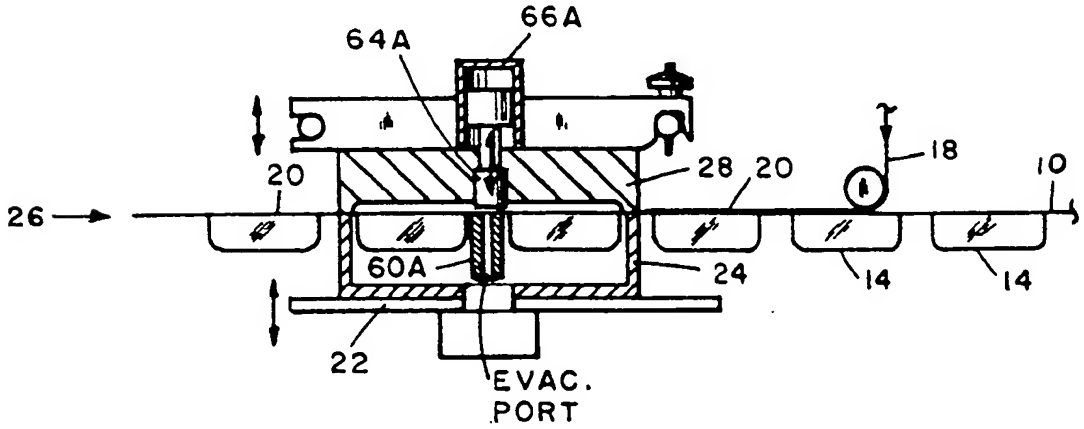


FIG. 1



SEAL REGION

FIG. 2

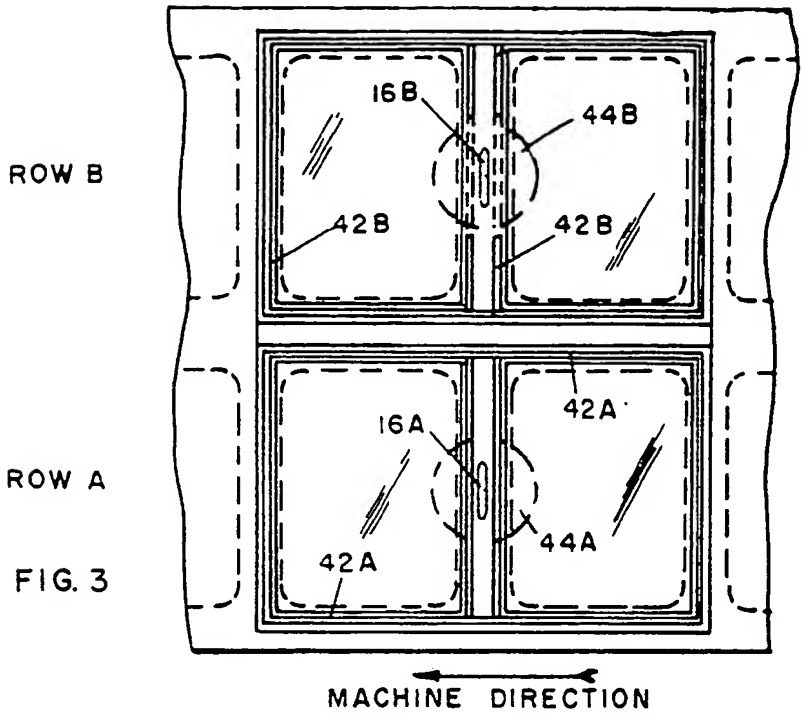

ROW B
ROW A
16B
44B
42B
42B
42A
16A
44A
42A
MACHINE DIRECTION

FIG. 3

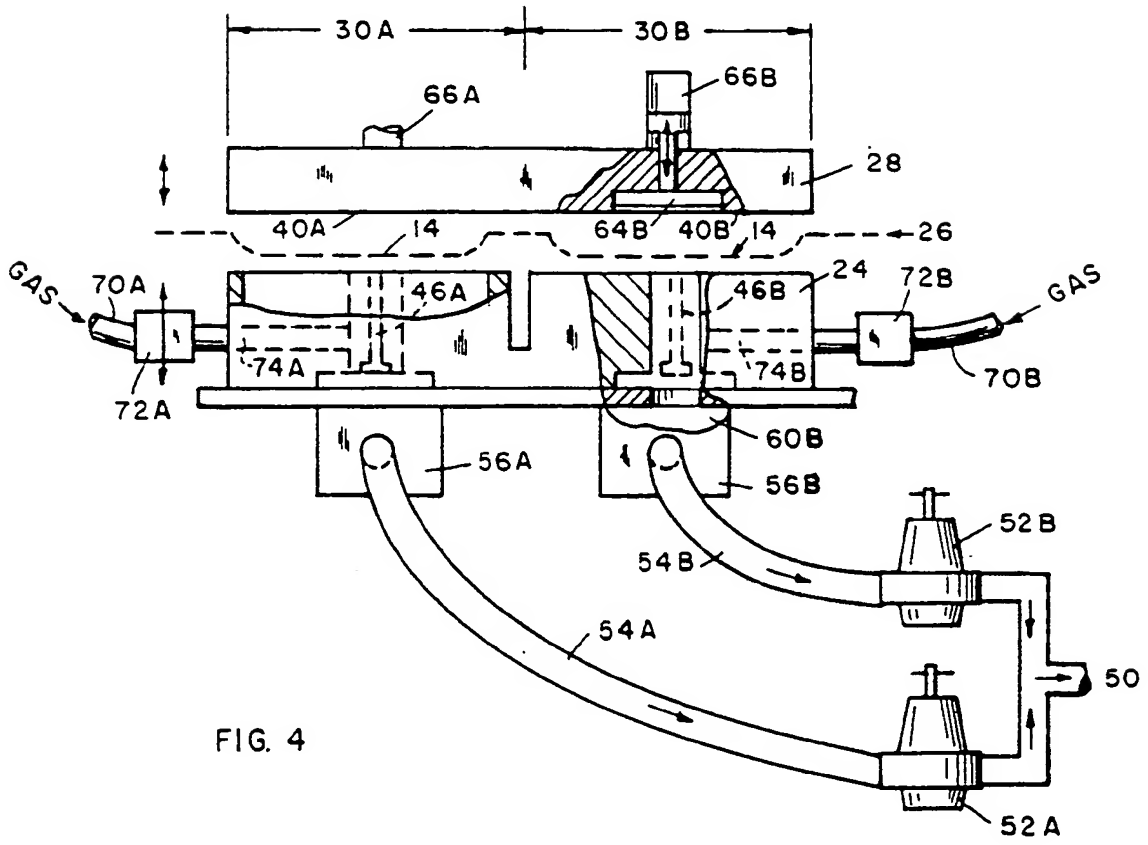

30A
30B
66A
66B
28
40A
14
64B
40B
14
26
GAS
70A
46A
46B
24
72B
GAS
74A
74B
70B
72A
60B
56A
56B
52B
54B
54A
50
52A

FIG. 4